[0025] FIG. **4** is a block diagram of a foldable display apparatus, according to an exemplary embodiment of the present invention.

[0026] FIG. **5** is a block diagram of the structure of a folding information detection unit, according to an exemplary embodiment of the present invention.

[0027] FIG. **6** is a flowchart of a method of displaying folding information corresponding to a foldable display apparatus, according to an exemplary embodiment of the present invention.

[0028] FIGS. **7**A and **7**B show examples of displaying folding information on display panels, according to exemplary embodiments of the present invention.

DETAILED DESCRIPTION OF THE EXEMPLARY EMBODIMENTS

[0029] Exemplary embodiments of the present invention will be described more fully hereinafter with reference to the accompanying drawings. Like reference numerals may refer to like elements throughout the accompanying drawings.

[0030] It will be understood that although the terms 'first' and 'second' are used herein to describe various elements, these elements should not be limited by these terms.

[0031] In the drawings, the sizes and thicknesses of layers and regions may be exaggerated for convenience of explanation, and thus, the sizes and thicknesses are not limited to those shown in the drawings.

[0032] FIG. **1**A to **1**C are schematic views of a foldable display apparatus **100** in folded and unfolded states, according to exemplary embodiments of the present invention.

[0033] FIG. **1**A shows the foldable display apparatus **100** in a folded state, FIG. **1**B shows the folding display apparatus **100** transitioning between the folded state and an unfolded state, and FIG. **1**C shows the foldable display apparatus **100** in the unfolded state.

[0034] The foldable display apparatus **100** includes a display panel **190** that is foldable. The display panel **190** displays images including, for example, text, video, pictures, two-dimensional (2D) images, three-dimensional (3D) images, icons, cursors, etc., which are processed in the foldable display apparatus **100**. For example, when the foldable display apparatus **100** is a portable computer, the foldable display apparatus **100** may display a user interface (UI), a graphical user interface (GUI), etc.

[0035] Since the display panel **190** may be folded, a form thereof may be changed according to a particular use. As a result, the foldable display apparatus **100** may be conveniently carried and stored. In addition, the foldable display apparatus **100** may display an image while in the folded state and the unfolded state.

[0036] At least one portion of the foldable display apparatus **100** may be flexible, and the foldable display apparatus **100** may be folded at one or more locations. Folding may refer to a state in which a shape of the foldable display apparatus **100** is at least partially deformed (e.g., not substantially flat). In exemplary embodiments, some parts of the foldable display apparatus **100** may be folded, and other parts thereof may not be folded. However, exemplary embodiments of the present invention are not limited thereto. In exemplary embodiments, all parts of the foldable display apparatus **100** may be flexible. Thus, a deformation degree of the foldable display apparatus **100** may vary according to exemplary embodiments.

[0037] The display panel **190** may include a flexible substrate formed of, for example, a foldable plastic material(s) or a metal foil(s), pixel units formed on the substrate, and a passivation film. The display panel **190** may be, for example, an organic light-emitting display apparatus, a liquid crystal display apparatus, an electrophoretic display apparatus, etc.

[0038] While in the folded state, various strains may act on the foldable display apparatus **100** in the folded parts. Further, when the foldable display apparatus **100** is in the folded state for a long period of time, the strains may accumulate, and thus, the foldable display apparatus **100** may become deformed, or imperfections (e.g., curves) may be formed thereon. The amount of accumulated strains may be in inverse proportion to a lifetime of a product. A method of relieving strains that result from the foldable display apparatus **100** being in the folded state is to leave the foldable display apparatus **100** in an unfolded state. Therefore, the ability of providing information to a user in both the folded and unfolded states of the foldable display apparatus **100** may be helpful in relieving the strains on the foldable display apparatus **100**.

[0039] FIGS. **2**A and **2**B are schematic views of the foldable display apparatus **100** in which a front portion and a back portion is folded, according to exemplary embodiments of the present invention.

[0040] The front portion or the back portion of the foldable display apparatus **100** may be folded along a virtual axis VA. At least one sensor **181***a* may be placed in a folding part **150** at which the foldable display apparatus **100** is folded. The sensor **181***a* is a sensor capable of detecting strain (e.g., a strain sensor). For example, the sensor **181***a* may sense values of strains resulting from the deformation of the folding part **150**. In this case, the values of strains may be, for example, an average value of the values sensed from the at least one sensor **181***a*. Thus, the at least one sensor **181***a* may be used to detect varying degrees of strains occurring at the folding part **150** of the foldable display apparatus **100**.

[0041] As illustrated in FIG. **2**A, the front portion of the display panel **190** of the foldable display apparatus **100** is folded along the virtual axis VA. As illustrated in FIG. **2**B, the back portion of the display panel **190** of the foldable display apparatus **100** is folded along the virtual axis VA.

[0042] When the front portion of the display panel **190** is folded, a top portion of a folded area is compressed, and a bottom portion thereof is extended. That is, a front surface of the display panel **190** (e.g., a display area) is folded, and a rear surface of the display panel **190** is extended, as shown in FIG. **2**A. When the back portion of the display panel **190** is folded, the top portion of the folded area is extended, and the bottom portion thereof is compressed. That is, the front surface of the display panel **190** (e.g., the display area) is extended, and the rear surface of the display panel **190** is compressed, as shown in FIG. **2**B. The folded state may correspond to the front folded state or the back folded state, the folding accumulation time may be classified into a front folding accumulation time and a back folding accumulation time according to the folded state, the folding information may be determined based on the front folding accumulation time and the back folding accumulation time, the front folded state may correspond to the foldable display apparatus **100** being folded in a first direction, and the back folded state may correspond to the foldable display apparatus **100** being folded in a second direction, opposite the first direction. During front folding and back folding, opposite pressures are applied to the front and back